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5:07, it had taken the birds just thirty-five minutes to wake up and leave the roost.

At Pasadena, later in the month, I got hints of several roosts, one in two Italian cypresses and an unusually spreading, dense umbrella tree. As the migrating hordes take such calm possession of the cities they pass through, roosts could doubtless be found all along their southern California route.

Washington, D. C.

THE GOLDFINCH IN CAPTIVITY.

BY J. CLAIRE WOOD.

As I must lie abed nearly seventeen hours a day, with no prospects of early improvement, what more natural than that my nature-loving temperament should crave a bit of animated nature to relieve the monotony of lonely hours, and what more appropriate than a goldfinch?

With this in mind I explored some promising bushland in Oakwood village on August 8, 1915, and found a nest about three feet above the ground in the vertical fork of a swamp oak branch. The total height of this oak was about seven feet and concealed in weeds eight to ten feet high. The nest contained four young and an egg about to hatch. Twelve days later the five young stood up in the nest alert and ready to flutter into the weeds at too near an approach. The sexes being separable in all plumages I selected one of the two males, and by a combination of strategy and quickness secured it.

With a bird in a small cage at my bedside I could give it the attention necessary to carry it through the critical stage and later transferred it to a large cage on the back porch. All went well until the morning of September 21 when, suddenly and for the first time, the bird developed a desire to escape, fluttering from place to place and pouring forth a volume of excited call notes. The disturbing factor was an adult female on a sunflower head in a cluster of a rare red variety growing in the yard, and henceforth this bird will be

known as B and the former as A. The evident desire of A for the company of his kind induced me to capture B and place her in his cage and at once he relapsed into former contentment, failing to be influenced by her frantic endeavors to escape. A was in passable plumage, but I had seen better examples in general plumage shade, depth of black on wings as in adults and amount of cinnamon edging on wing-coverts, and so I decided to examine more specimens. To accomplish this I used B for a decoy on September 27 and trapped thirteen among the wild sunflowers in Oakwood village. Twelve were immature birds, and of these I selected the two best appearing males, which become C and D.

I released B on October 15, but instead of leaving the premises she divided her time between the sunflowers, a cherry tree near the cage, the cage itself and the English sparrows. These pests kept her busy evading their attacks. Soon after regaining her liberty one drove her from sight among the trees in a westerly direction and she no sooner returned than another chased her around the house; in fact, the cage was the only sure haven of rest, for the sparrows regarded it with suspicion—an innate wariness that assures their preservation. She frequently tried to get inside the cage and remained so tame I could almost catch her in my hand and, despite all discouragements, remained two days, or until the food supply was exhausted, which consisted of the red sunflower seeds, those of the common yellow variety averaging so large and hard that a goldfinch can not crack them. On the last day I watched her go over the empty heads, looking carefully for stray seeds overlooked by the sparrows. When we remember that she was an adult bird, at least a year old, and that she was caught and released at the same place, her reluctance to leave can not be attributed to confusion, and considering the fact that for several days following their capture all goldfinches make frantic efforts to escape, and then the tension declines so rapidly as to be noticeable, until it is lost in apparent indifference, the probable solution is that any latent desire for freedom was dom-

inated by the strong social temperament so characteristic of her kind.

On October 21 a stray junior male was called down from the sky by the combined efforts of the trio in the cage. He was quickly trapped, examined and released and showed a total loss of all local interest by the rapidity of his disappearance into space.

In November the temperature began to average at steadily lowering levels, and it was becoming too cold for the birds, so I decided to bring them indoors, and having but two small cages I thought it better to release D than endanger the health of two birds by placing them in one small cage. D differed from B in that he would not leave at all, though there was no available food in the vicinity, and during his three days of liberty occasionally examined the sunflowers, but spent most of his time on the cage trying to reach the seed dish. Finally he became so weak and indifferent as to remain impassive while I stroked him with my hand, and it being evident that he would perish unless replaced in the cage, I put him there, but he died the following day. His conduct did not surprise me after my experience with B, for at the time of his capture he was probably less than two months old and had experienced little of the wild life, while his release took place in a season of gloom and cold, when no birds were left except the unfriendly English sparrows, nor any food supply visible outside the cage. Had I liberated B and D within sight or hearing of a flock of the species they would not have returned to the cage.

It is now early January, 1916, and I still have A and C. Their cages are beside each other in a window overlooking the cherry tree, but not once have the birds evinced a desire to get outdoors, probably owing to the winter drear. A being nest reared, is very tame and whenever he catches my eye tries to get to me by flying from perch to perch close to the wires to which he now and then clings with head protruding between them. He is teasing for cracked sunflower seeds, of which both are very fond and which he eagerly

takes from between my fingers. I never saw him try to leave the cage except to reach C or myself, while C has only tried to reach him. They spend the most time upon their perches nearest each other, where they frequently sit and sing together, but while playing about their cages and often while feeding they utter warbling calls and numerous conversational notes intermixed with fragments of song. After careful attention I can find nothing in the voice or action of either bird that expresses the least discontent with cage life.

There are emotional people who endow a captive bird with all the mental anguish of a human being torn from loved ones and thrust into prison and there are greater numbers who, at least, proclaim it wicked to imprison wild birds because they are constantly pining for freedom, but I do not think any of these people have kept and studied wild birds in captivity, and unless they have done so it is evident that they are merely straining their imaginations. I believe that under proper treatment certain birds fare better in captivity. A wild bird is menaced with death from all sides from such sources as weather uncertainty, food supply, accidents, mammals, birds, reptiles, etc., while in captivity it is protected from all this and the attending hardships, and so it remains only to determine how the bird feels its imprisonment. Instead of venturing what some would consider a biased opinion I will let the reader draw his own conclusions from the facts just presented.

About September 25 I began a series of experiments in an endeavor to get an approximate idea of the percentage of insects consumed by goldfinches, but the birds refused to touch insect food of any kind.

Immature plumages are not so near alike as one would suppose, for where a dozen males are kept together you soon know each individual, mainly through plumage differences, though aided by voice and action.

As might be expected, undersized goldfinches are lacking in vitality and are liable to succumb to exposure in a temper-

ture below freezing, and probably only the more hardy can survive the winter here.

I once found a dead goldfinch strangled by a horse hair that had become entangled in an American thistle.

Nestling goldfinches appear comparatively free from molestation and usually rear their young. As an illustration there was a swale where the three pairs of goldfinches were undisturbed, while the young in all the other nests were destroyed, consisting of two nests of Song and one of Field Sparrow and one of Cedar Waxwing.

I once trapped some two dozen goldfinches in September and released them the following May and shall always remember them as the embodiment of activity, noise and joyous sociability. They were not released direct from the cage, but confined in a box and carried into the country. In May of another year I liberated a mixture of Indigo Buntings and goldfinches from a cage on the roof of an office building in the business section of the city, and when I retired with the cage they were still in sight perched upon the surrounding buildings. It never occurred to me that perhaps some of them might return to the cage.

I never kept a number of goldfinches through the nesting season, but believe in such a case the birds would develop the natural tendency to mate and breed, or in other words, I doubt that confinement retards the radical changes of the reproduction period as shown by the enlargement of the sexual organs, etc.; anyhow, the male American Goldfinch has been exported to Europe, where the bird fanciers have produced hybrids by crossing it with the domestic canary, while so common are European Goldfinch-canary hybrids, that specimens are always on the market. They have also crossed the Indigo Bunting with the domestic canary, but the resultant hybrids are said to be of plain plumage, somewhat resembling the female Indigo.

From what I have said the reader must not be misled into believing that I sanction the indiscriminate caging of birds. One must have a natural interest in them and thoroughly un-

derstand their ways. He should begin with the seed-eaters, but not at all unless he feels possessed of the necessary qualifications, and then if the mortality among them exceeds one to a dozen in six months he should abandon further efforts, for this indicates improper management. If successful he is then entitled to try what aviculturists term the soft-bills, though he is advised not to do so, for they require much more care and must be constantly guarded against stale food, which results in disease and death. We have plenty of sweet singers among the seed-eaters, though the two most noted vocalists of America and Europe belong to the other class, namely, the mockingbird and nightingale. I have learned that the best results are not attained by duplicating the food eaten by a bird while in the wild state. For example, about half the food of the Indigo Bunting is of an insect nature, but in captivity he does better on an entire seed diet. While at liberty the goldfinch thrives on sunflower seeds of both the wild and the smaller headed cultivated varieties, but in confinement it must be deprived of such food which is too fattening where loss of liberty has curtailed the proper exercise and causes several fatal diseases, of which, perhaps, apoplexy is the most common. To keep a caged goldfinch in perfect health feed it the mixed German rape and Sicily canary, and nothing else, except a cuttle-bone fastened to the wires and gravel in the bottom of the cage. Change the water and gravel paper daily and clean the perches twice a week. See that the seed is free from dust and the cage dry and kept in an even temperature away from draught, but where the air is not impure. Each bird should have a square foot of space and does best in a cage by itself.